Trent Mesa Wind Project in west Texas.

ENERGY DEVELOPMENT

There has recently been a surge in interest in the production of alternative energy sources. This has been driven by a number of factors including the rapidly rising cost of fossil fuels, state-by-state requirements imposed on the power generation industry for certain percentages of power to be from alternative sources, and federal and state tax incentives. While solar energy is still receiving considerable attention, the two alternative energy options that are receiving more attention in Arizona are biomass and wind. The former involves the use of woody materials that are burned to produce power. A number of sites are being considered for biomass facilities including one at the Meteor Crater interchange. Besides power generation, the main benefit is a ready-made market for slash and small diameter trees.

The interest in wind power has been sparked by the development of wind resource maps supplemented by data collected by wind measurement towers, the development of much more efficient towers, as well as the tax incentives and renewable energy standards such as California's requirement that 20% of all power generated by 2017 must be from renewable sources. Wind is the most competitive of the renewable options.

There has been a considerable amount of interest in wind projects in northern Arizona in the last two years. Wind resource maps have identified a number of sites in Coconino County as having the potential to have enough wind to justify wind projects. Two years ago the Planning and Zoning Commission approved a wind test tower north of the Meteor Crater interchange that has been collecting wind data since. Other meteorological towers have since been approved on the south side of the interstate on both the Bar T Bar and Flying M ranches. Most have been in conjunction with NAU.

> Coconino County needs to be a leader in renewable energy. This is an incredible opportunity for our county and the right thing to do.
>
> *Liz Archuleta, Chair, Coconino County Board of Supervisors*

Wind Tower Technology and the Proposed Bar T Bar Project

The technology has changed considerably since the lattice towers and short pole towers of the 1970s. The latest technology involves towers that generally range from 60 to 100 meters (200 to 300 feet) in height to the hub on which the blades rotate, and vary in production from 1 to 3 megawatts. Those currently proposed on the Bar T Bar are 80 meters or 265 feet to the hub, with the total height to the tip of the blade being 405 feet or about 125 meters. The blade diameter is 82 meters, or 270 feet. The towers are approximately 16 feet in diameter at the base and are steel cylinders. The color of the towers is off-white with somewhat of a gray tinge. The blades are made of fiberglass and turn relatively slowly. The towers are positioned in rows with a separation between towers of about 1/4 mile. Distance between the rows is about 1/2 mile. Power generation is approximately 1.5 megawatts per tower, so with 27 towers proposed on the Bar T Bar ranch and 13 north of I-40 on Hopi-owned and other private land, the total project consists of 60 megawatts. According to the developer's materials, this is enough to power 14,000 homes. The electrical collection system from tower to tower would be underground, and there would be a small substation constructed to deliver the power to an existing 69 kV transmission line that runs from Winslow to Flagstaff. The power is then transmitted to the western power grid. The power would be used to meet peak power demands and would be used wherever the power was needed. A large power company would build, own, and operate the system, and APS is presumed to be the purchaser of the power. The life of the project is intended to be 30 years. The project is only economically possible because of federal tax incentives for alternative energy development.

Benefits of Wind Energy

There are numerous reasons to support the development of alternative energy. On a national scale there is a desire to reduce the dependence on nonrenewable resources such as oil, coal and natural gas that are used to generate electricity not only because of dwindling supplies, but also to curb the pollution generated from power plants utilizing these resources. Wind energy is clean and at the present time seems to be the most economically feasible. Generating electricity from solar power is not yet competitive. Electrical generation from biomass, while on the horizon, has not yet been implemented.

At the local scale, wind energy offers an economic opportunity for ranchers and other large property owners to generate revenue from land leases and royalty payments to supplement what can be a meager income from raising cattle. The County, as expressed in the *Comprehensive Plan*, would rather not see large ranches subdivided into 40-acre lots, and the best way to ensure that this does not happen is to sustain the economic viability of the working ranches. For the proposed Bar T Bar project, the applicant estimated that the annual lease payments to the property owners would be $220,000 averaged over the life of the project. This means about $5,500 per tower, with a lesser amount at the beginning of the 30-year life and a larger amount at the end. This represents considerable income to the property owners that can supplement income from ranching. While there is no direct offer by the property owners in conjunction with this project and this application to keep ranches intact, an assumption can be made that every economic opportunity could forestall the sale and possible subdivision of ranches into 40-acre ranchettes.

The wind resource on the ranches holds great potential as a source of renewable energy.

County Planning Issues

The most important issue related to the development of wind towers involves scenic vistas and viewsheds. Coconino County has some of the most spectacular scenery in the Southwest, and the roadway system provides direct access through some of the County's vast landscapes. The County has been aggressive in its attempts to protect the visual integrity of the County, with a comprehensive sign code adopted in 1981, a billboard ban in 1986, and cellular tower ordinances in 1989 and 2001, with the latter having specific visual resource criteria. Along the I-40 corridor and elsewhere on the Diablo Canyon ranchlands, there are beautiful views of the San Francisco Peaks, the Hopi Mesas, and Anderson Mesa. Along the I-40 corridor, cell tower applicants have been encouraged either to look for sites on the south side of I-40 because the view of the Peaks is on the north side, or to look for sites that are at some distance from the interstate rather than right next to the highway. For the ranches, the question is one of trade-off. Given the presumption that the development of wind towers is a good thing because it can assist large property owners in maintaining working ranches in order to maintain the ranches as open space, the decision to be made is where is the best location and where will the visual impact be minimized or be less important. Generally this is at some distance from the main roads, in locations that are not in a major view corridor of the San Francisco Peaks or other major geographic features, and in areas already impacted by other development such as high voltage transmission lines.

There are other county planning issues as well as environmental issues. It appears that the proposed Bar T Bar project would have minimal impact on wildlife habitat, watersheds, or fragmentation. The existing grazing should not be affected by the project. Impacts are not expected to be significant to large animal

> We need to move renewable energy forward for the benefit of everyone on the planet.
>
> *Deb Hill, Coconino County Board of Supervisors*

ENERGY DEVELOPMENT

GOAL

Facilitate the development of alternative energy projects while maintaining the integrity of the ranches and preserving aesthetics and views.

POLICIES

The County will work with prospective developers of wind energy projects to provide guidance on the best locations that will take full advantage of available wind resources but also protect viewsheds.

Wind projects shall be located at least one mile from major travel corridors such as I-40 and Highway 87.

To the extent possible, approval of wind projects shall be in conjunction with agreements to keep the ranches intact.

Monitoring for avian and other potential environmental impacts shall be a part of the approval process.

All power lines between the towers shall be underground.

To the extent allowed by the Federal Aviation Administration, there shall be a minimum number of lights on the tops of the towers.

Wind projects should be used as an educational tool to showcase alternative energy development.

If possible, a portion of the revenue derived from wind energy development should be used to assist Diablo Trust, conserve the land, do projects on the land, or otherwise work toward achieving the long term goals established by the Diablo Trust.

All wind tower projects shall include a condition of approval related to obsolescence and a required bond or letter of credit for removal of the towers.

wildlife species such as pronghorn. The main impact of concern is on birds. The subject area is not in any major bird migration corridors, and raptor and bat kills are expected to be lower than for other wind tower sites in the western U.S. According to the project proponent, the average for modern wind farms is 2.2 bird kills per megawatt per year. Of these 2.2 birds, 0.02 per megawatt per year represent raptor kills. There is also the potential for bat kills, though the bat population in the area is relatively unknown. Ongoing observation and study for the life of the project is recommended.

Wind towers are being treated the same as any public utility installation, which are therefore conditional uses in the rural zones. In the conditional use permit process, there are four findings that must be made for approval, and these are 1) that the use meets the objectives of the zoning ordinance and the purpose of the zone; 2) that the proposed use and location of the use is not detrimental to public health, safety, and welfare or materially injurious to properties in the vicinity; 3) that the proposed use will comply to each provision of the zoning ordinance except for any variances granted; and 4) that the use is consistent with the *County Comprehensive Plan*. The issues listed above are considered in the staff analysis.

Examples

There are no wind tower projects in Arizona. The Palm Springs area, the Altamont Pass area in Alameda and Contra Costa counties, and projects in Solano County, all in California, have hundreds of towers, and California leads the states with over 2,000 megawatts of wind power already developed. Other examples exist in Texas, New Mexico, Minnesota, Iowa, Wyoming, Colorado, the Dakotas, Oregon, and Washington.

Next Steps

The Bar T Bar has already negotiated an agreement for the construction of 27 wind towers on the ranch in sections located on both sides of Meteor Crater Road about two miles south of the interstate. The 40-tower project will utilize all of the available transmission capacity in the existing 69 kV line that is located north of the interstate. Currently the cost of connecting directly to a high voltage line is prohibitive. While the estimated $5 million cost to upgrade the existing 69 kV line may be deemed too high now, if federal energy credits are extended and if the State of Arizona adopts more aggressive standards for the amount of energy that must be produced from alternative sources, there will be a continued interest in new projects or expanded projects. Both Bar T Bar and Flying M have erected meteorological towers to test the feasibility of developing additional wind projects on a variety of sites around the ranch, and this data should continue to be collected, and the property owners should closely monitor the interest in further wind development, as well as push for an upgraded transmission line network.

Moqui Ranch (above) and other ranch-owned properties throughout the national forest may present some opportunities for limited home site development.

HOUSING

The economic development alternative chosen by many ranchers across Arizona is to sell off ranchland for residential development. This is usually pursued through the state's unsubdivided lands process with the ranchland being split into 36+ acre parcels, which can typically be split down further to a minimum of 10 acre parcels in Coconino County. The result is not desirable from a land use perspective as it results in fragmented parcels across the open landscape, affects wildlife habitat, and removes land from its historic ranching economy. This type of poorly planned development also results in lack of, or insufficient, infrastructure including roads, water, and other utilities. In the case of the Diablo Canyon RPA, the property owners and the County agree that this would be an unacceptable development pattern for the ranches.

Nonetheless, identifying some of the land area for possible future residential development is not necessarily contrary to the vision and goal of the RPA. This section will identify some alternatives, examples, and issues to consider with potential residential development as an economic option.

When we see land as a community to which we belong, we may begin to use it with love and respect.

Aldo Leopold

The ranches own a number of inholdings in the Coconino National Forest where conservation-based subdivision design could be appropriate.

Regional Housing Market

As developable land around Flagstaff gets built-out, there will be more pressure on outlying areas for residential development.

One aspect of the rural housing market that has not been addressed is "protected development"—which is an opportunity for a rancher to sell off a limited amount of land for residential development while preserving the integrity of the ranch, and for an opportunity for someone to purchase a building site with assurances that the open space value which they are attracted to will be protected.

Process

In considering options for residential development, thought should be given to issues which could impact the decision. Although the ranchers would typically not be the developers of residential areas, they need to consider these issues prior to making land available for someone else to develop and sell. These issues include possible conflicts between the residential area and ranchland. The alternatives discussed in this section anticipate that the ranches would maintain some interest in the future development, with either the ranches or the Diablo Trust being the recipient of annual assessments or fees for continued operation of the ranches and associated research.

Assessment of the land includes determining what area of the ranch is off-limits for residential development and what is available. There are two process examples used in other situations that describe approaches for assessing the developable areas of the ranchland.

The "sieve mapping" process is described in the book *Saving the Ranch: Conservation Easement Design in the American West*, by Anthony Anella and John B.

Wright. It is defined as being a qualitative analysis of the land to support long term protection of the land which is seen as a long-term monetary investment, versus the traditional quantitative analysis which focuses on short term monetary gain. The result of a qualitative process is a conservation subdivision. The process outlined by Anella and Wright in their book includes six steps. First is the identification of areas not to be developed, this includes conservation areas, natural features such as steep slopes, peaks, bodies of water, historic or archeologically sensitive sites, wildlife habitat, and areas that are integral to the ranching operation where direct interface with development would be unacceptable. The next step involves mapping the information developed in the first step. The suggestion is that each category would have its own overlay map so they can be compared and contrasted, which is step three, resulting in a composite map of the overlays. This is where the sieve mapping term is derived, as at this point the land that is not included in any of the overlays "falls through the sieve" and is what's left for possible development.

The next step is identifying the housing sites based on the exclusion of lands identified in the first steps. The authors suggest walking the land with the maps and camera in hand to identify "optimum and appropriate" building sites. Consideration should be given to views, topography, visibility of other houses, desirable weather/seasonal orientation, etc. The result of this step is an analytical diagram to ensure that the proposed developable areas are meeting the intended desire. The next step is road layout which avoids crossing conservation areas, creates inconspicuous roadways using contours and avoiding standard grid, minimizing road length to minimize costs, and using existing roads where possible. The final step is drawing the lot lines based on all of the previous steps.

In his book *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks*, Randall Arendt describes a similar approach using a context map and detailed existing resources and site analysis map, including trees, wetlands, views, etc. He also recommends a site visit to walk the property with the owner, planning staff, commissioners, and neighbors. In the case of the ranch properties it could include natural resource specialists, members of the Diablo Trust, as well as the ranchers. A sketch plan, and design standards for quantity and quality of open space are integral parts of Arendt's process.

Regardless which process, or combination of processes are pursued, there are essential questions that need to be addressed. A decision must be made about whether it is more desirable to have clustered lots or scattered home sites. This is based in large part on where the developable areas fall out of the sieve on the map. One step that is not included in either of the examples is provision of utilities. Early in the process a determination will need to be made as to what utilities will be required and how they will be provided. The expense of running utility lines will impact the developability and should be included in any sketch plan or sieve mapping process.

Other issues to be addressed when considering residential, or any development affect the restrictions on new residents, owners, or visitors. One of the primary questions is what area of the ranch should be off-limits for use of future residents? Not just where development is not acceptable, but where access is not acceptable. This should be included in the same map analysis process described above. A related question is whether residents/owners will be granted easement rights to use any part of the ranch. If so, how will that be described and what will their use allow or be

restricted to? Will lot owners pay monthly or annual fees that will go back to the ranch or to the Diablo Trust for operations/monitoring, etc? What restrictive covenants would be necessary and/or desirable to place on residential housing development (e.g. possible design criteria, fencing restrictions)? Trail access across the ranch to public lands, or accessible ranch lands should also be considered. Certainly, some of the benefits for purchasing a building site within a working ranch would be accessibility to desirable sites that are part of the undeveloped lands.

Possible Approaches

Open Space/Cluster Subdivisions concentrates development of residential lots in a cluster in less sensitive areas of a site without compromising the visual aesthetics of the open ranchland. The trade-off for approving smaller lots is the protection of the open ranchland through a conservation easement.

Scattered or limited development is desirable if only a few locations are deemed acceptable for single family development. If there is a desire to minimize impact or encroachment of residences on ranchland, only a few larger parcels are identified as developable. This would no doubt include some sort of monthly/annual contribution from the lot owner to maintenance of the ranchland, or Diablo Trust research.

The current zoning on the private property within the RPA is General, with a 10 acre minimum parcel size for residential development. Development under any of the scenarios would require some zoning changes, presumably to allow for smaller lot sizes as a trade off for preserving large expanses of open ranchland, or in the case of scattered large parcels it would be desirable to rezone to a larger minimum parcel size, also in conjunction with open space preservation.

Case Studies

Heritage Ranch has five different properties in New Mexico which are part of the "Protective Community" concept of development, one that creates home sites within ranches. The purchase of the home sites helps fund the Heritage Ranch Institute which manages the properties. The ranches remain working ranches operated by the Institute. The lot sizes range from six acres to 40 acres.

Montosa Ranch Project (New Mexico) is described in the book *Saving the Ranch: Conservation Easement Design in the American West*. Using the "sieve" method, the owners evaluated different options with a focus on limited, protected residential development. This case is similar to the Heritage Ranch concept but on a smaller scale.

Routt County, Colorado has adopted a minimum county zoning of 35 acres, consistent with the state subdivision law that allows the creation of 35-acre lots. Routt County has adopted an ordinance that allows the number of homes at 1

Participating in the preparation of the RPA was a growing experience. I was forced to think about what I really wanted to see out here (and what I don't want to see) 20-50 years from now. And that was something that needed to be done.

Judy Prosser, Bar T Bar Ranch

per 35 acres plus one bonus unit for each 100 acres set aside as open space. For example, a 280-acre ranch gets 8 lots plus two bonus lots for a total of 10 lots, average size 8 acres, with 200 acres set aside as open space. The purpose is to allow the ranchers to sell off a few parcels without breaking up the agricultural land. The smaller lots sell for more than the 35-acre parcels because of the protection of open space. Although Arizona has different subdivision laws and Coconino County different zoning, there is some transfer potential.

Regulatory Issues

Development of homesites will require some level of county approval, depending on what process is pursued. Improvement requirements for scattered homesites on large parcels will have a different level of service requirement than a cluster development with smaller lots clustered together.

All subdivisions would go through a formal review and approval process with the county and state. The purpose of identifying alternatives through the RPA process that in theory are acceptable to both the ranches and the County is to provide some level of assurance that if they decide to pursue residential development as an economic alternative in the future, it will be consistent with the County-approved plan.

Planning and Zoning Issues

In order to give greater guidance to the County in consideration of future development proposals, this plan identifies the rancher's preference if residential development were to be pursued—locations appropriate for smaller lot cluster developments and/or sites where larger, scattered parcels may be deemed appropriate. The *County Subdivision Ordinance* currently requires fencing where residential development is proposed adjacent to ranchland. This provision is counter to the concepts identified above, so a waiver would be necessary. However, in creating a development proposal, the interaction between grazing livestock and human residents would need to be addressed, including possible restrictions on private fences and pets, for example.

Next Steps

The ranchers have identified several private inholdings which they consider potential locations for future housing development consideration. Prior to making these lands available for development, or pursuing zoning and subdivision requests, it would be appropriate for the landowners to make the site assessments outlined in this section, to identify more specific issues for each potential site. Designation of building areas, provision of utilities, access, etc. would be identified through this process, as well as locations which would be restricted from future development. It will be important to involve the County in this process so questions of regulatory restrictions and development standards can be considered at the beginning stages, rather than later in the process.

Coordination with all regulatory agencies which would have some involvement in approving residential development should also be pursued early in the process to understand what level of improvements and what approvals will be necessary. These include but are not limited to ADEQ (Arizona Department of Environmental Quality), ADWR (Arizona Department of Water Resources), Coconino National Forest, and Blue Ridge or Mormon Lake Fire District.

HOUSING

GOAL

Consider limited housing development which is sensitive to and compatible with the historic ranching use of the land and preserving the unfragmented open space, landscapes, wildlife habitat, and natural areas.

POLICIES

The County supports alternatives to the conventional pattern of 40-acre lot development, for example by allowing the same number of units as allowed by current zoning, but clustered on a portion of the property, in order to retain ranching on the majority of the land.

The County will assist the property owners in determining the most viable and desirable location for housing development from a planning perspective.

Adequate facilities and infrastructure shall be part of any residential development. The determination of "adequacy" will not be based on subdivision requirements alone, but on the type of housing (clustered vs. dispersed) and the ability to provide services. Waivers from typical requirements, such as paved access, will be considered in order to meet the goals of the RPA and achieve ranch-appropriate design.

Housing and other improvements associated with residential-related development should incorporate appropriate rustic design features that reflect the cultural context and heritage of the ranches.

OTHER IDEAS TO CONSIDER

A number of economic development options are described in detail within this plan. These options represent real opportunities for the ranchers to expand their existing use of the land while maintaining the guiding principles of preserving the ranching heritage. The options described in significant detail were those noted by the planning committee as being some of the most interesting and those with the most potential. However, a number of other potential ideas were initially discussed and deserve some consideration within this plan. Some uses have the potential to generate a much greater source of income for the ranchers while others may not generate significant amounts but may be additional sources of revenue with limited input from the ranchers. Many of the uses listed within this plan have the potential to be combined together. The following is a brief review of five other options including native seed production, heritage and specialty crops, raising sheep and goats, mining, and filming. Contact and resource information for each of these topics can be found in the appendix.

Indian ricegrass, a native of the region, is highly palatable for wildlife and livestock, and was used as a traditional food source by indigenous people.

Native Seed Production

The idea for native seed production was generated from the significant need for seed after the recent large forest fires in northern Arizona. The native seed helps to stabilize soils after fire and prevent erosion. The production of seed however is not an easy feat. The seeds are essentially produced as a crop, requiring weeding and irrigation. A significant amount of equipment may be needed in order to maintain and harvest an adequate seed crop. It is quite possible that a substantial capital investment would be required depending on the size of the crop. There is also a significant amount of hand labor required from tending the crop to cleaning the seed. Weed seed in seed crops is not acceptable in anything but trace amounts so equipment has to be cleaned regularly to prevent weed infestation. The harvested seed is also cleaned prior to sale. It is possible to establish clients that will purchase the seed on a large scale such as Arizona Game and Fish, Forest Service, and State Land Department, but this is not always easy to set up. Profits are highly dependent on other market forces. For the past five years seed prices have steadily gone down and are currently about half of what they used to be due to increasing suppliers entering the market. The market may not be as difficult within northern Arizona as there are no large scale native seed producers nearby. As this use falls under the agricultural exemption there would be no planning and zoning review for a project on ranch lands. Native seed may not be a project that the ranchers would undertake themselves, but the ranches may provide the land resource to another interested party.

Heritage & Specialty Crops

The production of "heritage crops" centers on traditional American foods that have not become commodity products and are at risk of extinction. Heritage crops include a wide variety of edible plants including the Marshal Strawberry which survives only in the form of a single clone at a USDA laboratory. Preservation efforts have been undertaken by a number of groups to grow and utilize such heritage products. Heritage crops are not limited to plant products but include livestock and poultry. Traditional crops work in conjunction with their ecological

surroundings. A coalition has been developed to promote the preservation and use of these heritage crops—RAFT (Renewing America's Food Traditions). This coalition includes the Center for Sustainable Environments at NAU which is a strong local resource for the ranchers if they were to pursue this idea. Specialty crops include more rare items that are not readily available as a commodity item or fall within the more expensive commodity products. These products could be used traditionally by different ethnic groups that can be sold and distributed on a local level. See the direct-marketing section of this plan for more detailed information on resource distribution. Ranchers could take on the production of heritage or specialty crops on their own or in conjunction with a partner or simply lease land for a local producer. The profit margin adjusts with each option. This use also qualifies as agricultural in nature and would be exempt from planning and zoning review. One exception would be if the ranchers were to pursue on-site sales which could require a conditional use permit for more temporary sales and possibly a rezoning for more permanent installations.

Hopi corn is a classic example of a traditional heritage crop.

Sheep & Goats

It is possible to include other animals in the existing ranching activities already occurring within the project area. Other animals that were mentioned included buffalo, elk, sheep and goats. Buffalo and elk have unique challenges and do not appear to be an exciting option for the ranchers. However, sheep and goat production was discussed as a potential use for the ranchers. Sheep and goats have a multitude of uses; they can be raised for meat, for wool, for dairy purposes, and for land clearing projects. A dairy operation would require goats to be kept in close quarters and under special diets in order to provide a consistent milk product. Dairy operation can also require a lot of manual labor on the smaller scale which includes milking the goats up to twice a day. If a rancher were to have an interest in pursuing a goat dairy operation, then products could also be direct-marketed locally. A dairy operation would require a conditional use permit to operate, because this use is very similar to a concentrated feeding operation.

If ranchers were to introduce sheep and goats into their livestock portfolio they would most likely be raised for meat and wool. This use would not require any review from planning and zoning as it falls under the current agricultural exemption. The use of these animals for meat production could remain similar to the current cattle operation or could be used in a direct-marketing project. For example, the Navajo Churro sheep are a heritage animal that could be marketed specifically based on the breed. The existing processing plant in Chino Valley will process sheep and goats in addition to cattle and could be marketed similar to beef. Meat goats can also be used in land clearing projects. Meat goats are used in Hawaii to clear abandoned sugar cane plantations, and in California they are used to clear land for fire breaks, as well as for fuel load reduction and the rejuvenation of lands. In order to use goats in this manner, they have to be controlled which can be done with portable polywire electric fence which can be used in creative ways to maintain goats. Also, many goat farmers use the Great Pyrenean Mountain guardian dogs to watch over the animals. The meat goats have a greater potential to fit within the existing ranch environment and could be incorporated into the land management principles used by the ranchers.

Moqui (above) and other ranch properties could provide scenic locations for film productions or commercial advertising photo-shoots.

Mining

An idea presented to the ranchers early on in the RPA process was the potential for mining materials primarily used in road construction. The most desired material is basalt, but some forms of chert and limestone are also acceptable. The Babbitt Ranch currently has a similar mining operation occurring near Grey Mountain. This lease brings in a substantial income for the Babbitt Ranch with little capital outlay. This idea appears to be a reasonable option if the required material is available on ranch lands and is accessible via existing roads. A resource inventory would need to be conducted to determine if the right materials are present. The most significant cost involved with mining would not necessarily be economic, but environmental, as the mining of material will permanently scar the landscape. Mining is also exempt from planning and zoning review.

Mining on private lands is most often set up through a contractual arrangement between the landowner and the potential mine operator. Contracts can vary widely in levels of sophistication and detail. The most significant aspect of a contract to mine would be the price or royalty paid to the property owner. For sand and gravel type operations, this price is usually expressed as an amount per ton or cubic yard. Prior to mining, on-site exploration activities will have to be conducted to ensure that there is an adequate supply of the desired material. These arrangements also

vary widely from informal agreements to formal contracts specifying any number of details and provisions. Mining can also be pursued on state and federal lands. The state land process requires a hardrock exploration permit prior to issuance of a lease. The state land process may be easier than trying to develop mining rights on federal land. More information on both processes can be found in a document entitled *Laws and Regulation Governing Mineral Rights in Arizona*. Further information can be obtained from the Arizona Department of Mines & Mineral Resources. This department does not issue permits, and is not a regulatory agency. Their principal function is to promote mineral resource development in Arizona as well as maintain a library of information.

Filming

There is the potential for ranchers to market their property as filming locations. Arizona has provided an imaginative background for many a film, television show, and commercial. With such a close proximity to the center of the industry in southern California, a pristine northern Arizona ranch could be the perfect setting for the film/television industry. There are a number of ways that this marketing can be accomplished. There are on-line services that will list the property information for a fee, which is then provided to individuals within the film industry. There are several other local contacts, including both public and private, that can be made to encourage use of the ranches for film locations. The ranchers would need to decide what areas of the ranches would be appropriate for this type of use, what type of rent would need to be charged, and develop a contract which would require the film crew to insure themselves and any damage that might occur to the ranch. There is a ranch is southern Arizona with its own web page that advertises their services to the filming industry.

Next Steps

Depending upon the options selected above, the follow-up steps to commence a project on either ranch is to determine what agency, department, or association would be the most beneficial to work with. For example, there are a multitude of products that the ranches could produce that could be taken through the direct-marketing process. For more information on direct-marketing, see the value-added beef portion of this document. The above listed suggestions of native seed, heritage crops, goats and sheep could easily be expanded into poultry products or pork. Obviously, it would need to be something that the rancher would feel comfortable adding to their portfolio of existing uses. There is definitely a market for locally produced goods in this area.

The other options presented here would require obtaining different types of information and contacts. Information on these potential contacts is located in the appendix. Mining has a potential to produce a substantial amount of income depending upon the availability of materials and ease of access. An exploration project would be the first step in assessing this potential. The option to open up the ranches to groups looking for filming locations would need to be evaluated in terms of the costs to the ranches as opposed to the benefits. The type of operation that is involved could greatly impact the effects that the ranchers would face in sharing their lands for a temporary period of time. It would seem fitting at least to try out the potential of this use to see how it fits within existing ranching operations.

OTHER IDEAS

GOAL

Supplement ranching operations with other economic development options to expand the existing use of the land while maintaining the guiding principles of preserving the ranching heritage.

POLICIES

The County shall work with the property owners in the pursuit of other economic development options.

Such land uses shall seek to minimize impacts on nearby residential areas, primitive roads, and physical alterations to the landscape.

Bar T Bar winter range.

The challenge in maintaining open space is to pay for it by finding viable options that ensure long-term economic viability. The Diablo Trust and Bar T Bar's win/win proposal before the City of Flagstaff is a unique opportunity to do just that. It proposes selling water rights on 5,500 acres to the City. This land and an additional 45,000 acres donated by Bar T Bar would be held under a conservation easement. Income from an approved wind farm would go to the City. We really are trying to think outside the box.

Bob Prosser, Bar T Bar Ranch

LAND PROTECTION OPTIONS

Most ranchers in Coconino County, including those in the Diablo Canyon RPA, have a desire to keep their ranches intact and retain the traditional grazing use of the property. However, because the value of the family estate is usually tied up in the value of the property, because grazing may not generate sufficient revenue to sustain the families adequately, because there may be issues with aging families with children who are not interested in pursuing an agricultural career, and because estates may not be set up in a manner that offers children options, there is often a desire to draw cash from the property through sale. Other than outright sale and the economic possibilities discussed in this plan, there are possible approaches to "cash out" and protect the land. These include the sale of conservation easements or development rights, the transfer of development rights, and grass banking.

Conservation Easements

A conservation easement is a legal document that limits development of property. The development rights are donated or sold to a nonprofit conservation organization, a land trust, governmental entity or other organization legally entitled to hold easements. Easements are generally permanent, usually prohibit all development except that needed for grazing uses, and have a value of about 55% of the total development value of the property. If donated, there are federal income and estate tax benefits, and if sold there are cash benefits and potential property tax savings. Easements can be temporary, although this would eliminate tax benefits, and temporary easements could be used to slow development and to protect the land for a set period of time in order for the family to assess options.

The rancher continues to own and use the land within the bounds of the easement language. Some of the rights associated with the land are given up, for example the right to subdivide and build additional buildings, but the right to operate a ranch is retained. Conservation easements are typically pursued because of the property owners' love of the land and their desire to protect the land from inappropriate development while retaining ownership.

Easements are very specific in terms of what can and cannot be done on the land, and there is a considerable range in the way they can be written—from allowing no development or improvements of any kind, to allowing limited development. To enjoy the tax benefits, an easement would likely have to eliminate virtually all revenue-producing activity other than the traditional uses. At a minimum, the establishment of an easement requires legal advice, an appraiser familiar with easements, and an organization willing to accept the easement. There are resources potentially available at both the state (Arizona Open Space program) and federal (farmland protection program) as well as private sources such as the Nature Conservancy to purchase easements.

Conservation easements are often not granted for entire ranches, but for a majority of the ranch that contains the highest environmental and wildlife habitat values. Ranch headquarters and other areas of the ranch that are more suitable for development are not included in conservation easements.

Grama grass.

Purchase of Development Rights

PDRs are generally used interchangeably with conservation easements, but there could be a scenario where the purchase of development rights would be preferable because of a lack of interest in meeting generally included conservation values and monitoring that are included in easements. PDRs involve assigning value to permitted development and sale of development rights at that value.

Transfer of Development Rights

A TDR program involves the sale of development rights in one area, generally identified as the "sending area," and purchase of those development rights for use in another area, the "receiving area." This is a market approach with willing property owners at both ends. In approximately 160 jurisdictions across the country, none in Arizona, TDR programs have been implemented, and lands have been identified where development is not desirable, usually either to protect environmentally sensitive lands or to protect farmland or ranchland, and other areas have been identified where growth is appropriate. Property owners in the growth-appropriate areas could increase the allowed density of development, for example from an allowed 50 units to a desired 75 units, by buying 25 units of development from a property owner in an area where land protection is desired. Once the development rights are purchased in the sending area, the land is permanently protected as open space or for agricultural uses. In Arizona, municipalities have had the legal authority to adopt TDR programs for many years, though none has. Counties were given the legal authority in the 2005 legislative session with the addition of Arizona Revised Statutes Section 11-821.03. Several counties are in the process of developing ordinances in order to implement TDR programs.

Grass Banking

The following section is from the Sonoran Institute web site. Permission has been granted to reproduce the information here.

> ***Grassbanks:*** The purpose of a Grassbank is to make possible the ecological restoration and productivity of grazing lands. By improving the condition of the land, a Grassbank can strengthen the foundation of a region or area's ranching heritage. It can also help reduce conflicts between grazing and other land uses.

LAND PROTECTION

GOAL

Preserve working ranches, unfragmented landscapes, and the natural character of the Diablo Canyon ranches.

POLICIES

The County shall work with the property owners to explore all options pertaining to conservation easements, including the dedication of temporary easements.

The County shall adopt a transfer of development rights ordinance and work with property owners to identify sending and receiving areas.

The County shall encourage the clustering of development on certain portions of the property in order to conserve most of the private lands as working ranches.

Conservation easements and other protection mechanisms will be focused on areas of the ranches that have the highest value for habitat and open space protection.

Grassbanks require collaboration among ranchers and, generally, public land managers, so that the grazing lands involved are of sufficient size to allow restoration of land and the rotation of cattle to actively grazed areas. The rested portion of the land may then be allowed to grow a crop of grass that may then be burned in a controlled fire. Such a fire can check and even reverse the encroachment of trees and shrubs into grasslands. Alternatively, other treatments could be considered, such as small-diameter timber removal or brush control and reseeding. Continued rest for one or more grazing seasons will allow desired new vegetation to grow prior to returning livestock to the area.

If ranchers are able to move their cattle to other grazing lands while restoring all or part of their lands, there would be no need to reduce or suspend normal ranching operations. A Grassbank thereby makes it possible for a rancher to maintain the economic viability of his or her operation and removes a significant disincentive for enhanced range management.

In addition to the Malpai Borderlands Group, the Conservation Fund is involved in a Grassbank initiative in northern New Mexico, involving the U.S. Forest Service and the Northern New Mexico Stockman's Association. The Conservation Fund has bought a property qualifying it to become a permittee of a substantial grazing allotment within the Santa Fe National Forest. The Fund will allow other national forest permittees from northern New Mexico to graze on their allotment while the Forest Service and the permittees restore other grazing allotments.

Planning and Zoning Issues

Conservation easements are done outside the planning and zoning process. However, they can be inextricably linked. In certain situations, in order to justify recommending approval of a rezoning to allow higher density in a rural area, there might be an expectation that a conservation easement would be created on all or a portion of the remainder of the land. Open space zoning can also be used to create an additional layer of protection, although a conservation easement if given in perpetuity provides much more permanent protection than zoning.

A TDR program could and most likely would involve the County as intermediary, though it could be set up as a program between willing and interested property owners.

Next Steps

As stated above, the Arizona State Legislature authorized counties to adopt transfer of development rights programs. A model ordinance is being developed that should be completed in early 2006. Once completed, Coconino County will proceed with the adoption of a county TDR ordinance, and then working with large property owners and developers pursue how best to implement an effective TDR program.

In terms of conservation easements, the identification of lands that the ranches may consider for a variety of economic uses such as housing, tourism, and energy development was the first step in also identifying lands that should be considered for conservation. The ranch families should pursue all options related to conservation easements including temporary easements, as well as available funding sources to purchase easements.